ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER I

WATER RESOURCES

I. WATER RESOURCES

A. OVERVIEW

The water resources of Fairfax County include its streams, groundwater, ponds, and lakes. These serve as sources of drinking water, recreation, and habitat for a myriad of organisms. One-third of the land in the Fairfax County Park system, around 5,000 acres, is stream valley parkland. These stream valleys are significant corridors for the County trails system and wildlife.

1. Streams

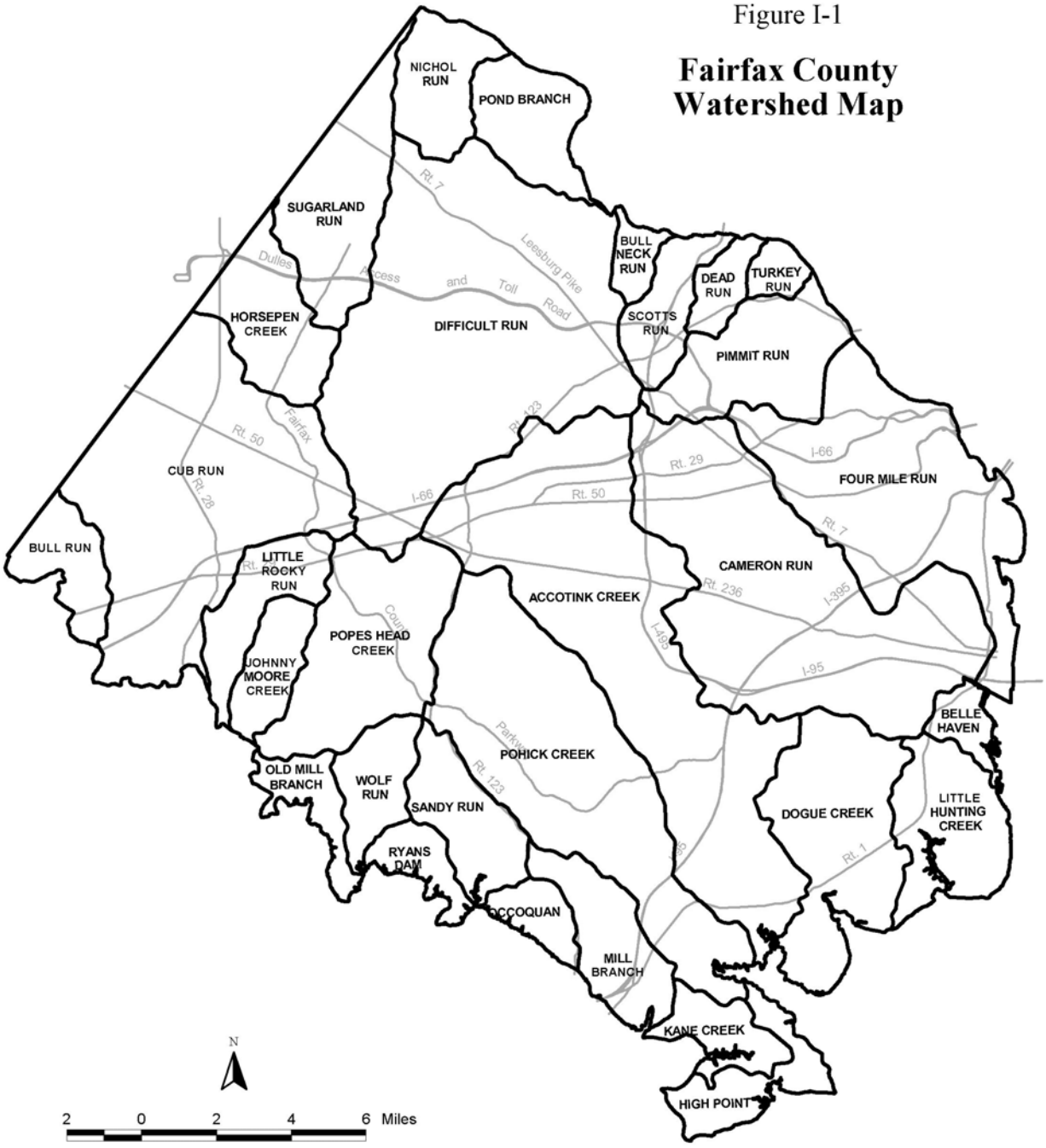
Fairfax County is criss-crossed by a variety of natural streams, often called runs or creeks. These streams are considered flowing water habitats. Rainfall soaks into the earth and drains to low points within the surrounding land, then emerges from the ground as seeps, springs, and trickling headwaters. These tiny threads of running water join with others in the same drainage area to create a stream system. A stream is a system of fresh water moving over the earth's surface. There is a natural progression in size from the smallest tributaries to the largest rivers into which they eventually flow. Perennial streams flow throughout the year and intermittent streams flow only part of the year. There are approximately 850 miles of perennial streams within Fairfax County fed by smaller intermittent headwater streams.

2. Watersheds

A watershed is an area from which the water above and below ground drains into a particular stream, river system, or larger body of water. Everyone in Fairfax County lives in a watershed with a name and with drainage boundaries. The larger stream watersheds usually have sub-basins. There are 30 separate drainage basins or watersheds within the County (Figure I-1). For example, the largest watershed in Fairfax County, Difficult Run (58 square miles) has ten streams that drain into the main stream, Difficult Run. It, in turn, drains into the Potomac River. The Potomac River watershed is a sub-basin of the even larger watershed, the Chesapeake Bay watershed, which is 64,000 square miles and extends from New York through Pennsylvania, Delaware, West Virginia, Maryland, Virginia, and the District of Columbia. All Fairfax County streams are in the Potomac River watershed and subsequently the Chesapeake Bay watershed.

Figure I-1

Fairfax County Watershed Map



3. Stream Ecosystems and Communities

Within a stream are shallow areas called riffles where the velocity is rapid and the bottom consists of boulders, stones, gravel, and/or sand. Dissolved oxygen levels are high because water is flowing over rocks, mixing air into the tumbling water. Alternating with riffles are deeper pools and runs where water speed slows and small particles of mineral and organic matter fall to the bottom and oxygen levels are reduced. Each of these stream regions has a diverse community of plants and animals that spend all or part of their life cycles in the water.

4. Communities

The aquatic food chain begins with leaves and other decaying plant and animal material called detritus. These are carried into the stream from the surrounding forests and fields by wind and water runoff. Food sources also include aquatic vegetation such as algae. Bottom–dwelling (benthic) macro (large) invertebrates (back-boneless) animals eat this organic matter. These include snails, clams, aquatic worms and crustaceans such as crayfish, but the most ecologically important are the aquatic insects such as stoneflies, mayflies, caddisflies, and true flies. In turn, these macroinvertebrates are eaten by fish, birds, and other streamside wildlife, such as frogs, salamanders, and small mammals.

5. Oxygen

Oxygen is vital to organisms that live in a stream just as it is to terrestrial animals. Submerged animals use oxygen dissolved in the water. Most aquatic insect larvae, such as mayflies and stoneflies, absorb oxygen through their body walls but many are aided by the use of structural gills. Fish absorb oxygen by drawing water in through the mouth where it passes over internal gills. High levels of dissolved oxygen are essential to the life functions of a healthy stream community.

6. Trees, Wetlands, and Buffers

A buffer of trees lining the banks of streams is another essential part of a healthy stream system. The temperature in a stream greatly affects how much oxygen it can hold. Since warmer water holds less oxygen, trees are vital along the bank or edge of stream or river. Shade from the tree canopy maintains cool water temperatures so the water will hold more oxygen.

Tree cover also provides food and floating detritus for shelter when leaves and branches fall into a stream. Streamside forests offer food, nesting sites, and protection to a great diversity of streamside wildlife including birds, turtles, beaver, and snakes. Tree roots stabilize fragile stream banks and give cover to fish, crayfish and aquatic

insects. Forested buffers absorb high percentages of excess nutrient runoff.
Wetland areas adjacent to streams can be forested or open wetlands. These wetlands serve as transitions to stream channels and help to attenuate the affect of stormwater and remove pollutants.

7. Nutrients

Nitrogen and phosphorus are nutrients essential to the growth and development of all plants. But an overabundance of either can damage stream ecosystems dramatically. Forested buffers can retain and utilize as much as 89% of the nitrogen and 80% of the phosphorus runoff associated with land use practices. In excess, these nutrients become major pollutants causing the rapid growth of algae in streams, rivers, lakes, and estuaries. When the algae dies and begins to decay, the bacteria breaking down the algae uses up the dissolved oxygen necessary for other aquatic life.

B. POLLUTANTS AND OTHER IMPACTS ON STREAMS

1. Point and Nonpoint Source Pollution

Water-polluting substances originate from either nonpoint or point sources. Nonpoint sources (NPS) include surface runoff, atmospheric deposition, and groundwater flow. Because of their diffuse and intermittent nature, NPS are difficult to control. NPS pollutant loads are greatest following rainfall events. A significant part of the NPS load consists of nutrients, including nitrogen and phosphorus (e.g., organic matter, fertilizer), that are substances that stimulate algal growth. Other NPS pollutants are sediment (e.g., from eroding lands, construction sites, and stream banks during high-flow, high-velocity conditions), toxics (e.g., oil, paint, chemicals and metals), pathogens-fecal coliform bacteria (e.g., animal waste, failing septic and leaking sewer systems), and trash.

Point sources are specific locations that discharge pollutants. They are relatively constant and provide a steady flow of pollutants. In the Potomac Basin, most point sources are either wastewater treatment plants (WWTPs) or industrial discharges. Point sources contribute small portions of the nutrient loads during high flows and the majority during low flows.

2. The Effect of Imperviousness on Streams

As development occurs, impervious surface increases as driveways and buildings are placed on land that once had trees and other vegetative cover that absorbed water and its contents. With the increase in impervious surface and loss of vegetative cover, there is a concurrent increase in the amount and speed of stormwater running off the land carrying sediment to nearby streams. Sediment is a major non-point source pollutant

reaching streams and rivers that drain to the Chesapeake Bay. Silt and sand scour stream channels, which erodes the banks and causes loss of tree cover. This in turn allows water temperature increases. This silt and sediment also gets deposited on the bottom covering where macroinvertebrates live, cutting off their oxygen supply. This change in bottom substrate usually results in a change in the diversity of organisms—a loss in the numbers and kinds of animals and plants in stream. There is usually a concurrent increase in the numbers of floods that occur where water spills over the banks of streams and onto adjacent lowlands. Over time, this increased flooding and sediment depositions leads to channel widening, loss of pools and riffles and increased pollutant levels. In urban and suburban watersheds, rain flows off impervious surfaces such as parking lots and highways, carrying oil and other automobile wastes into streams. During summer storms, these heated surfaces contribute to raising the temperature of water runoff into streams.

C. STREAM AND WATERSHED ANALYSES

Ongoing testing is conducted by the Fairfax County Health Department, the Fairfax County Department of Public Works and Environmental Services (DPWES), and the Virginia Department of Environmental Quality (VDEQ). The Audubon Naturalist Society, the Northern Virginia Soil and Water Conservation District, and the County Health Department Adopt-A-Stream program also provide volunteer help and data. At present, the County's Health Department and the Department of Public Works and Environmental Services are both doing comprehensive monitoring of Fairfax County streams. The summary of all this data should provide the first comprehensive understanding of the condition and health of Fairfax County's streams.

1. Countywide Stream Assessments

a. Countywide Stream Protection Strategy Baseline Study

i. History

In September, 1997, the Fairfax County Board of Supervisors requested that staff from the Department of Public Works and Environmental Services (DPWES) evaluate the *Montgomery County Maryland, Countywide Stream Protection Strategy* to determine its applicability in addressing water quality issues and provided an initial allocation of $250,000. Upon completion of the evaluation in 1998, the Board approved an additional $250,000. Work was initiated in September of 1998, was completed by December 2000 and was published in January 2001. This study gives a holistic ecological assessment of all County streams.

ii. Study Parameters

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All major non-tidal streams and tributaries within the 30 watersheds of the County have been assessed. The field component of this assessment involved the collection of data from a total of 138 sites/reaches, 13 of which were established as Quality Assurance/Quality Control (QA/QC) sites. Of the 125 principal monitoring sites, 114 were reflective of conditions within Fairfax County and 11 were sampling locations in nearby Prince William Park that were used to aid in the development of "reference conditions" to which all sites were compared. Data collected on the health of streams included the following four components, and a numeric ranking of overall quality was assigned based on these data:

1) Index of Biotic Integrity, or "IBI" (the numbers and kinds of benthic macroinvertebrates present) (Figure I-2);
2) A general evaluation of localized watershed and stream features, including stream channel and adjacent steam valley habitat and stream morphology (figure I-3);
3) Fish taxa present (numbers and diversity of fish) (Figure I-4); and
4) Calculations of the overall of the overall percent impervious cover within each watershed based on upon available Fairfax County GIS data (Figure I-5).

The County will continue long term monitoring of streams with a five-year rotating schedule of sampling so that each site will be resampled at least every five years. Additional data on smaller tributary streams will continue to be provided by volunteer water quality monitors from the Northern Virginia Soil and Water Conservation District and Audubon Naturalist Society. (See below for description of these Volunteer Monitoring Programs.)

iii. Ranking and Results

The ultimate numeric score for each sampling location reflects the site's degree of departure from reference or "highest-quality" conditions. These composite values were then assigned to one of the following qualitative categories: Excellent, Good, Fair, Poor, and Very Poor.

The County stream sites were ranked as follows: Excellent - 8.6%, Good – 14.7%, Fair – 31%, Poor 32.8% and Very Poor –12.9%. Those watersheds that were in good and excellent health had the least amount of impervious surface and the watersheds that were most heavily degraded had the greatest impervious surface. The relationship between impervious surface and one of the measured components of stream health (the Index of Biotic Integrity) is

presented in Figure I-6.

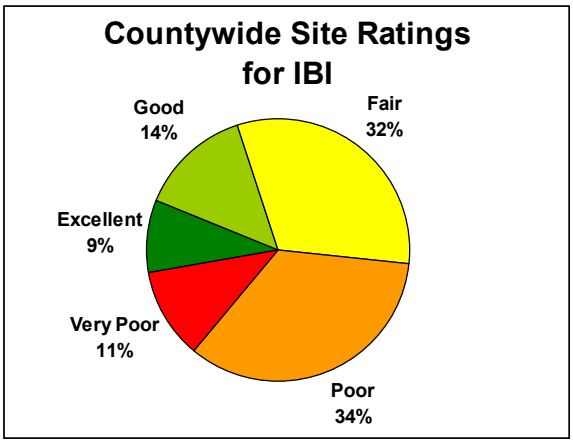

Figure I-2. Percentage of SPS monitoring sites scoring in each of the five IBI quality categories.

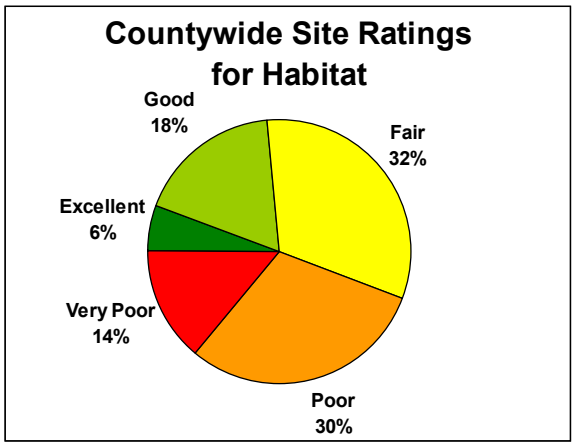

Figure I-3. Percentage of SPS monitoring sites scoring in each of the five Habitat quality categories.

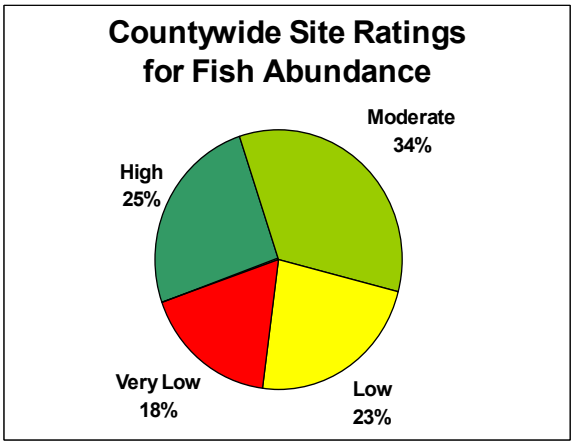

Figure I-4. Percentage of SPS monitoring sites scoring in each of the four Fish abundance categories.

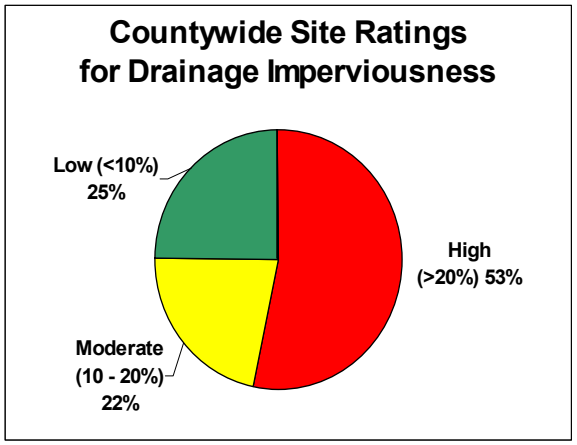

Figure I-5. Distribution of Imperviousness at SPS monitoring sites.

Source of Figures I-2 through I-5: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream Protection Strategy, Baseline Study*, January, 2001.

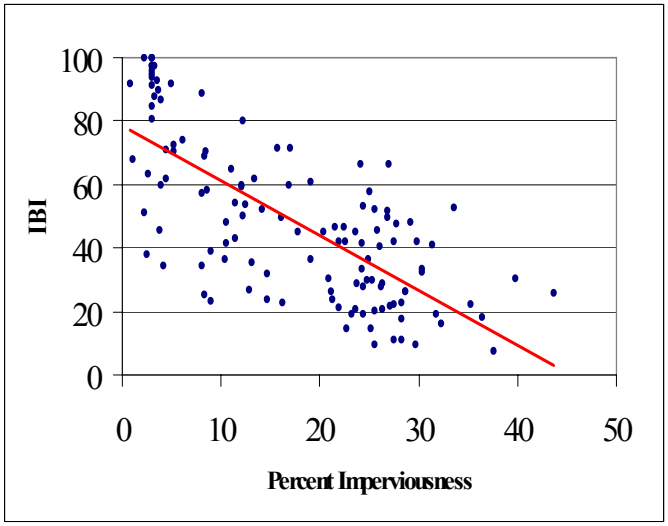

Figure I-6. Trend line indicating that Biological integrity, as measured by an Index of Biotic Intetrity (IBI) for benthic macroinvertebrates, generally decreases with increasing percent imperviousness. Source: Fairfax County Department of Public Works and Environmental Services, *Fairfax County Stream Protection Strategy, Baseline Study*, January, 2001.

iv. Management Strategies

Based on overall stream rankings and projected development within each watershed, three management categories were established to provide recommendations for future efforts:

1) Watershed Protection – Watersheds in this category will be areas with low development density and which currently possess streams with biological communities that are relatively healthy and have a composite ranking of Good or Excellent. The primary goal of this category is to preserve biological integrity by taking active measures to identify and protect, as much as possible, the conditions responsible for the current high-quality ratings of these streams.

2) Watershed Restoration Level I- Watersheds in this category have a composite rating of Fair or, rarely, Poor and a projected imperviousness of less than 20%. The primary goal of this category is to re-establish healthy biological communities by taking active measures to identify and remedy causes of stream degradation, both broad scale and site-specific.

3) Watershed Restoration Level II –Watersheds here have a composite rating of Poor, Very Poor or, rarely, Fair and a projected imperviousness of greater

than 20%. This category will likely be categorized by high development density and significantly degraded stream segments. The primary goal is to prevent further degradation and to take active measures to comply with Chesapeake Bay initiatives.

The report is online at:
http://www.co.fairfax.va.us/gov/dpw/spss/homepage.htm

b. Volunteer Water Quality Monitoring Programs

i. Northern Virginia Soil and Water Conservation District (NVSWCD)

The Northern Virginia Soil and Water Conservation District (NVSWCD) manages a water quality monitoring program in Fairfax County, which is conducted by qualified volunteers. The program includes training and certification of monitors, data management and analysis, and quality control. Four times a year, volunteers conduct a biological assessment, using the Save Our Streams protocol. They determine the general quality of the water by evaluating the type and diversity of aquatic macroinvertebrates. They also record their observations of the surrounding watershed, including land uses, the amount of streamside and stream bank vegetation, tree canopy, and signs of erosion and other pollution. The monitors conduct water chemistry tests for temperature, turbidity, and nitrates to assess the water quality. In 2000, 12 sites reported winter data, 20 reported in the spring, 39 in the summer and 39 in the fall.

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ii. Audubon Naturalist Society (ANS)

ANS also manages a volunteer water quality monitoring program in the region that currently includes 35 monitors, with an average of four monitors for each of the eight sites in Fairfax County. Two sites are in E. C. Lawrence Park and are monitored by Park staff. The ANS program uses a modified version of the Environmental Protection Agency's (EPA's) Rapid Bioassessment II protocol, which includes assessment of in-stream and streamside habitat parameters and a survey of benthic macroinvertebrate populations. There are three required monitoring sessions (May, July, and September) and an optional winter monitoring session between December and February. ANS staff performs data entry and quality control activities. ANS also furnishes all monitoring equipment and training. Monitor training includes macroinvertebrate identification (order and family level), protocol practicum, habitat assessment, and benthic macroinvertebrate adaptations. Monitors are recruited in semi-annual introductory workshops. The water quality monitoring program is part of a larger watershed awareness program that includes slide show and video presentations, watershed walks, and other presentations.

iii. Fairfax County Park Authority

Park Authority staff members have, at several County park sites, worked with citizens on stream monitoring projects. Long-term data are being collected at established monitoring points through efforts that are being coordinated at three nature centers and at Lake Accotink Park. The Park Authority has also recruited a volunteer to act as a Stream Cleanup Coordinator. This individual will work to organize stream clean-up events in non-staffed stream valley parks.

2. Fairfax County Health Department Water Quality Report

The Division of Environmental Health in the County Health Department produces the other comprehensive review of Fairfax County streams. In 2000, data were collected from 85 sampling sites throughout 25 of 30 watersheds in Fairfax County. A total of 1,277 stream samples were collected for analysis.

Twenty-three site visits were made by the Health Department to investigate 13 stream complaints in 2000. Four dealt with dumping and trash in streams and nine with color and odor. Two of the complaints required action to be taken by the Fairfax County Health Department and on required action by the Fire Marshall's office.

The report is online at http//www.co.fairfax.va.us/service/hd/strannualrpt.htm.

a. Fecal Coliform

These bacterial organisms are found in the intestinal tracts of warm-blooded animals including humans, and therefore can be indicative of fecal contamination and the possible presence of a pathogenic organism. In surface waters, fecal coliform (F.C.) bacteria should not exceed 200 fecal coliform bacteria per 100 ml of water.

–In the watersheds tested, Fairfax County streams met the standards of < 200 F.C./100 ml (considered GOOD) 14% of the time. Several streams had readings exceeding 1,000 F.C./100 ml.

Because of excessive and persistently high coliform counts in Accotink Creek, a TMDL (Total Maximum Daily Load) is underway. See the description below in the section entitled “Special Stream Reports and Programs.”

b. Dissolved Oxygen

The presence of dissolved oxygen (D.O.) is essential for aquatic life, and the type of aquatic community is dependent to a large extent on the concentration of dissolved

oxygen present. Dissolved oxygen standards are established to ensure the growth and propagation of aquatic ecosystems. The minimum standard for dissolved oxygen is 4.0 mg/l.

–Ninety-nine percent (99%) of the samples collected for determination of D.O. were above the 4.0 mg/l range. The Mill Branch sampling station showed readings below 4.0 only 50% of the time (two out of four samples collected). This sampling site is located downstream from a debris landfill and could indicate that organic contaminants are entering the stream. This site has been dropped from the sampling schedule after four samples were collected in 2000 and it was determined that the amount of available water to sample was insufficient for proper evaluation. This sampling site is monitored by Virginia's Department of Environmental Quality.

c. Nitrate Nitrogen

Nitrate nitrogen is usually the most prevalent form of nitrogen in water because it is the end product of aerobic decomposition of organic nitrogen. Nitrate from natural sources is attributed to the oxidation of nitrogen in the air by bacteria and to the decomposition of organic material in the soil. Fertilizers may add nitrate directly to water resources. Deposition of nitrogen compounds from air pollution also occurs. Nitrate concentrations can range from a few tenths to several hundred milligrams per liter. In non-polluted water, they seldom exceed 10 mg/l. Nitrate is a major component of human and animal wastes, and abnormally high concentrations suggest pollution from these sources.

–The samples for nitrate nitrogen ranged from a low of 0.09 mg/l to a high of 13.4 mg/l. The overall nitrate nitrogen geometric mean was 0.6 mg/l, well below the maximum limit of 10 mg/l. Three samples taken (in November and December) in the Old Mill Branch watershed at Station 25-4 were above the maximum contamination level of 10 mg/l.

d. Phosphorus (Total)

Phosphorus is found in natural water in the form of various types of phosphates. Organic phosphates are formed in the natural biological process--by organisms existing in the water, contributed to sewage in body wastes and food residues, and/or formed in the biological treatment process for sewage. Condensed phosphates and orthophosphates are found in treated wastewater, laundry detergent, commercial cleansing compounds, and fertilizers. Phosphorus is essential to the growth of organisms and is usually the nutrient that limits growth of organisms in a body of water. Therefore, the discharge of raw or treated sewage, agricultural drainage, or certain industrial wastes may stimulate nuisance quantities of photosynthetic aquatic organisms and bacteria.

–There is no established limit for phosphorus in stream water. This year's geometric mean of 0.10 mg/l does not indicate a significant increase over prior years' averages

e. Temperature

The existence and composition of an aquatic community also depends greatly on the temperature characteristics of a body of water. The maximum standard for free flowing streams is 89.9^{o} F (32^{o} C).

–The temperature range for all stream water samples collected in 2000 was 32^{o} F for the low in December and 80^{o} F for the high in August. The average temperature was 54^{o} F and this reflected a slight downward trend in the water temperature of the samples collected over the last twelve years.

f. Heavy Metal and Toxins

The presence of heavy metals in stream water indicates possible discharge of household and industrial waste into streams. Arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver are monitored for based on their occurrence in industrial and household waste, their potential health hazards, and as part of the Virginia Department of Environmental Quality water requirements.

–All results are within normal limits.

g. pH

Stream pH is an important factor in aquatic systems. The pH range of 6.0 - 8.5 generally provides adequate protection of aquatic life and for recreation use of streams.

–The pH ranged from a low reading of 4.1 to a high of 10.7. Eight samples were above the 8.5 limit and six samples were below the 6.0 limit. Follow up testing indicated normal pH.

h. Summary

The average geometric mean for fecal coliform bacteria at several of the stream sample sites is approaching and surpasses 1,000 F.C./100 ml. (This is definitely not in the good range). The chemical and physical parameters have remained constant over the past five years. Therefore, the Health Department considers the overall water quality of Fairfax County watersheds fair for fecal coliform bacteria and good for chemical and physical parameters.

The Health Department ends its Water Quality Summary statement with the following caveat:

> "In summary, any open, unprotected body of water is subject to pollution from indiscriminate dumping of litter and waste products, sewer line breaks and contamination from runoff pesticides, herbicides, and waste from domestic and wildlife animals. Therefore, the use of streams for contact recreational purposes, such as swimming, wading, etc. which could cause ingestion of stream water or possible contamination of an open wound by stream water, should be avoided."

3. Health Department Volunteer Monitoring Program (Adopt-A-Stream)

This program, which is administered by the Environmental Services Section of the Health Department, was initiated in 1989 in response to a recommendation of the County's Environmental Quality Advisory Council. Its objective is to make people aware of stream pollution issues and to establish a network for reporting pollution incidents. At present, 95 groups, representing more than 500 individuals, participate in the program. DPWES uses information from the Adopt-A-Stream program to help identify pollution sources.

4. Virginia Department of Environmental Quality (DEQ)

The Virginia Department of Environmental Quality maintains 16 sites in Fairfax County: Accotink Creek (three sites), Cub Run, Difficult Run (two sites), Dogue Creek, Occoquan River (two sites), Pimmit Run, Popes Head Creek, Pohick Bay (three sites), Sugarland Run, and Mills Branch. The data list sources of types of runoff, and for three of the streams, the reason for their placement on Virginia's list of impaired waters (the "303(d) list").

5. Special Stream Reports and Programs

a. Accotink Creek TMDL (Total Maximum Daily Load)

Due to excessive fecal coliform bacteria counts, a 4.5 mile segment of Accotink Creek in Fairfax County, beginning at the confluence of Crook Branch and Accotink Creek to the start of Lake Accotink, was placed on the 1998 Virginia 303(d) TMDL list. A TMDL is a highly structured watershed-specific plan for bringing an impaired body of water into compliance with the Clean Water Act goals. A two-year study began in December, 1998, headed by the U.S. Geological Survey, in partnership with the Virginia Department of Conservation and Recreation (DCR), the Virginia DEQ, and Fairfax County. The sample collection

and analysis, which began in April 1999, to determine the "type" of fecal coliform found in streams is now complete. Preliminary results indicate the source of bacteria are distributed as follows; 40% waterfowl, 20% human, 13% dogs, 5.4% raccoon, 1.4% deer, and 21% other. A proposed solution and a source reduction implementation schedule are required.

b. Four Mile Run TMDL and the Four Mile Run Program

Although only the very upper reaches of Four Mile Run occur in Fairfax County, it is important to note the existence of a TMDL for Four Mile Run and the participation of Fairfax County in the Four Mile Run Program.

The Four Mile Run Program is the oldest continually active program of the Northern Virginia Regional Commission (NVRC). The four jurisdictions (Arlington County, Fairfax County, the City of Falls Church and City of Alexandria) through which Four Mile Run flows are involved in the program. The program was founded in 1977 to ensure that future development would not result in increased flooding in the watershed. Today, all development and redevelopment is analyzed through the Four Mile Run Computer Model to determine whether on-site detention of stormwater is necessary to prevent downstream flooding. In 1998, the Four Mile Run Agreement was amended to address urban water quality issues in addition to flooding.

The Four Mile Run Fecal Coliform Study to determine the sources of fecal coliform in the watershed using DNA was completed in 2000. The study found that waterfowl contribute over one-third (37%) of that bacteria that could be matched; humans and dogs combined contribute 26%, and raccoons contribute 15%. Bacteria from humans appear to be highly localized. Significantly, the study found that without regard to specific host animals, E. coli bacteria seem to regrow, through cloning, within the storm drains and stream sediments, which in turn perpetuates bacteria levels.

NVRC has received funding from the Virginia DEQ to develop a TMDL for bacteria in Four Mile Run by May 2002.

c. Kingstowne Stream Restoration Project

In 1998, Fairfax County, the Northern Virginia Soil and Water Conservation District, the U.S. Natural Resources Conservation Service, and two citizens groups (the Friends of Huntley Meadows and the Citizens Alliance to Save Huntley) formed a partnership to restore a stream that is located in the Kingstowne community. This stream is a tributary of Dogue Creek and is upstream of Huntley Meadows Park. Started in October and finished by December 1999, the

Kingstowne Stream Restoration Project is now functional. The project used principles of geomorphology and soil bioengineering to create gentle meanders that slow the velocity of flow and natural vegetation to stabilize the stream banks. Testing has substantiated that erosion has been brought under control and water quality downstream is improved.

With respect to the Kingstowne Monitoring program (to assess the adequacy of erosion and sediment controls installed on developing sites in the Kingstowne community), between January and December 2000, 19 storm event samples and 12 base flow samples were collected and analyzed to determine pollutant loads in Dogue Creek. Based on the monitoring data, the 85% sediment removal efficiency was achieved for all storm events. Therefore no stop work orders were issued to the developer during the year 2000.

D. PONDS AND LAKES

All ponds and lakes in Fairfax County are man-made by excavation and/or the damming of streams. These open water impoundments are their own communities and have many of the same organisms as streams. Most provide recreational opportunities for humans. Due to increased runoff in more urbanized areas, they are often subject to heavy sediment and nutrient loads. Heavy sedimentation means that most of the lakes have to be dredged on a regular basis in order to maintain pond or lake depth. Heavy nutrient loads result in large algal and plant blooms over the warmer months of the year.

Reston has several large lakes (Lake Newport, Lake Anne, Lake Thoreau, and Lake Audubon) that are managed by the Reston Association and are monitored for algae growth and sedimentation.

The six Pohick watershed lakes (Barton, Braddock, Huntsman, Mercer, Royal and Woodglen) are inspected annually for dam structure but are not monitored for biological or chemical parameters.

The Lake Barcroft Watershed Improvement District (WID) is a local taxing district authorized by Virginia Law for conservation purposes. In 1999, Lake Barcroft had about 15,000 cubic yards of dredge spoil from the lake to dispose of. In order to avoid the costs associated with hauling it to a landfill, they rented a huge topsoil screening machine and excavator to load it, converting the waste material into topsoil by filtering out all the sticks, stones, beverage cans and other debris. The topsoil was then made available to local residents for a modest delivery fee. Some innovative BMPs (Best Management Practices), such as flow regulators, check dams, a diversion debris trap, a stormwater injection pit, and a street sweeping program have been implemented by the WID. These BMPs are being studied for both their capacity to reduce pollution and improving water quality in the lake

and its tributaries, possibly leading to Countywide implementation. The WID also has a program to purchase and distribute high quality lawn fertilizer in 50-pound bags (the fertilizer has been formulated without phosphorus) and to sell the fertilizer to homeowners.

Lake Accotink is owned and managed by the Fairfax County Park Authority. County government has recently authorized the expenditure of $6,000,000 to dredge and remove 200,000 cubic yards of sediment from the lake. There are other significantly sized lakes within the County. Many are centered within developments and have dwellings built along the banks of the lakes. There are numerous smaller ponds throughout the County that are found within communities or commercial developments. Some are associated with golf courses and many serve as stormwater management ponds.

E. STORMWATER MANAGEMENT AND SOIL AND EROSION CONTROL

1. Status of Stormwater Utility (Environmental Stormwater Utility) Concept in Fairfax County

In December of 1998, a draft report by the Stormwater Utility Advisory Group (SUAG) to the Board of Supervisors was circulated for review. The report addressed several issues relating to the implementation of a stormwater service charge program for Fairfax County. Activities were suspended leading up to the fall 1999 Board of Supervisors elections. DPWES is evaluating the need to conduct a more comprehensive public information campaign to articulate need and gain wider public support. During the summer of 1999, the firm of Camp, Dresser and McKee (CDM) was requested to develop a concept paper/report on framing significant aspects of the County's existing stormwater control program and present ideas and recommendations on the essential elements of future stormwater program. CDM submitted a draft report in December of 1999. A final edition was completed by March 2000. Work on public outreach is proceeding but any further action awaits full funding and the implementation of the stormwater utility fee program by the County.

2. Status of NPDES Requirements

The National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit was issued by the Virginia DEQ with an effective date of January 24, 1997. This is a Phase I (five year) permit and will end in 2002. A Phase II permit will then be issued which will be under new Federal guidelines. TMDLs will be tied into the new permit. In March, 2000, the 1999 Annual MS4 Report was submitted and accepted by the Virginia DEQ.

The present Permit terms basically require the County to continue with its present stormwater management program. This includes, among other things, efforts to construct and maintain ponds and other types of water quality and peak shaving facilities. The Maintenance and Stormwater Management Division of DPWES will perform inspection of privately owned stormwater management facilities on a regular basis (every five years). Water quality will be monitored at six storm sewer outfalls four times a year (seasonally), and 100 outfalls per year will be monitored during dry weather to determine the presence of illicit discharges.

During 2000, the County continued to evaluate BMPs (best management practices), undertook several stream restoration projects, continued with the monitoring of six wet weather and 105 dry weather outfalls, and inspected 1,411 stormwater control facilities.

3. Regional Stormwater Management Program

a. Background

Since the early 1980s, the County's *Public Facilities Manual* (PFM) has included a provision that encourages the concept of regional stormwater management. As opportunities arose, major developers as well as County staff pursued regional stormwater management primarily through the development process. An overall plan identifying the most appropriate locations for regional facilities was needed to improve this process.

In January 1989, the Board of Supervisors adopted a plan prepared by the engineering firm of Camp, Dresser and McKee. The plan, intended to be a pilot program, consists of a network of 134 detention facilities that will directly control 35 square miles of drainage area. To date, over 45 regional ponds in the Regional Stormwater Management Plan have been constructed. Currently there are 25 facilities in various stages of implementation. Fifteen potential facilities are in the final design phase either as County managed projects or via developers through rezoning. Ten potential facilities are in the preliminary design phase.

b. Creation of new Stormwater Planning Division (SWPD)

Created in February 2000 by the Director of DPWES after approval by the Board of Supervisors, this new division is to review current countywide policies affecting the ecosystem and stormwater management issues. SWPD is to promote policies to improve and protect the quality of life and support the environmental goals of the County.

c. Changes in County Mowing Policy at Stormwater Management Ponds

During the summer of 2000, in support of the interim tree policy adopted by the Board of Supervisors in 1999, the County revised its pond-mowing program. The interim tree policy provides opportunities for planting trees beyond the areas currently allowed under the Public Facilities Manual. The mowing program reduces the area mowed in and around a stormwater management pond by an average of 60% per pond. This program has resulted in the planting of 15 ponds with additional pond plantings under consideration by adjacent homeowners.

d. Publication of "Maintaining BMP's- A Guidebook for Private Owners and Operators in Northern Virginia"

Published in February 2000 by the Northern Virginia Regional Commission, the guidebook specifically targets homeowners/civic associations and small businesses that may have responsibility for BMP maintenance. The guidebook addresses simple maintenance tasks, how to plan for long-term BMP maintenance costs, and where to go for additional information.

e. Stormwater Management Seminar

On April 26, 2000, the Northern Virginia Soil and Water Conservation District held an all day meeting at the County Government Center to address several issues:

1) Public support for a dedicated funding source for a stormwater utility fee;
2) Upgrades, repairs and retrofits of existing stormwater facilities; and
3) Protection and restoration of damaged streams.

The sessions, designed to assess the current state of stormwater management and ways in which it can be improved, were attended by 230 people from County government, the building industry, homeowner and citizen associations, and environmental groups.

4. Infill and Residential Development Study

The combination of development patterns in the County and a growing concern over water quality issues led to a May 1999 request from the Board of Supervisors for the "Infill and Residential Development Study". The study was completed in 2000 and released to the public. The Board of Supervisors accepted the final recommendations at a public hearing January 22, 2001. The Study staff have reviewed the effectiveness of current policies regarding erosion and sediment (E&S) control and storm drainage with the dual goal of minimizing any impacts of stormwater from a proposed

development on downstream property and limiting the impacts of stormwater management facilities on a neighborhood.

Recommendations of the study include:

- An enhanced erosion and sediment control program, including the revoking of land disturbing permits during egregious violations;
- Allowance of the use of chemical erosion prevention products, and bonded fiber matrix on highly sensitive soils or on steep slopes;
- Adoption of innovative BMPs;
- Amendment of the Public Facilities Manual to include Super Silt Fence requirements, Storm Drain Inlet Protection Devices, and Faircloth Skimmers;
- Improved requirements for early review of stormwater management facilities as part of the rezoning process;
- Improved requirements for evaluating the adequacy of stream channels for increased runoff due to new developments;
- Development of a BMP monitoring program; and
- Enhancement of education programs for citizens, staff, and industry regarding E&S control importance and creation of an E&S Hotline.

F. NONPOINT SOURCE POLLUTION PROGRAMS

1. Chesapeake Bay Program

Pursuant to the requirements of the Chesapeake Bay Preservation Act and Chesapeake Bay Preservation Area Designation and Management Regulations, the Chesapeake Bay Local Assistance Board (CBLAB) has determined that Fairfax County's Comprehensive Plan is consistent with the Act and the Regulations, subject to a condition that the County amend its Comprehensive Plan such that the following will be accomplished:

- The provision of Chesapeake Bay Preservation Area maps somewhere within the Plan;

- The development of a shoreline erosion control inventory (characterizing rates of erosion along the County's tidal shoreline areas) and related policies and strategies that can be implemented through the Wetlands Board review process;

- The development of an inventory of existing and potential shoreline access sites, with a focus on boat-related facilities, and the consideration of one or more Plan policies establishing criteria for the siting of such facilities;

- The development of policies, where appropriate, that address water quality-related recommendations outlined in the Infill and Residential Development Study; and

- The development of an inventory of existing pollution sources and the development of policies, where appropriate, to address water quality improvement in redevelopment areas.

The activities listed above must be completed by December 31, 2003. It should be noted that many, if not all, of the above requirements can be incorporated into a supplement to the Comprehensive Plan (that can be referenced within the Plan), and that other jurisdictions have proceeded in this manner.

The agricultural portion of the Chesapeake Bay Preservation Ordinance requires landowners with land in agricultural uses to have conservation plans. The Northern Virginia Soil and Water Conservation District (NVSWCD) prepares soil and water quality conservation plans and provides technical assistance in the implementation of approved plans. NVSWCD has written plans for all Agricultural and Forestal Districts that have Resource Protection Areas within their limits. Currently, NVSWCD is working extensively with horse owners and keepers, since a large percentage of agricultural land use in Fairfax County is related to horse operations. These operations require innovative land management and careful nutrient management to prevent and reduce pollution in runoff to nearby streams. As of July, 2000, plans had been approved for more than 8,129 acres of land containing approximately 213,008 linear feet of Resource Protection Areas (100-foot vegetative buffers on either side of a stream). $64,000 had been paid to Fairfax County citizens who manage these horse operations to cost share the implementation of agricultural best management practices. It is estimated that 7,191 pounds of nitrogen and 838 pounds of phosphorus have been kept out of Fairfax County waterways as a result of these efforts.

In June, 2000, the Northern Virginia Regional Commission hosted a Better Site Design Workshop for Communities implementing Virginia's Chesapeake Bay Preservation Act. This workshop featured a roundtable of professionals to discuss impediments to implementing better site design principles. The workshop had 75 participants, many of whom were Fairfax County staff and appointed/elected officials.

2. Erosion and Sedimentation Control and Enforcement--Fairfax County Department of Public Works and Environmental Services

DPWES is planning the implementation of organizational improvements to the Environmental and Facilities Inspection Division (EFID, formerly the Site Inspection Branch) that will result in a greater emphasis and a higher quality of inspection services associated with erosion and sediment control. They will be developing a new quality assurance program and will be training Field Specialists (a newly established position).

Field Specialists will be responsible for resolving all erosion and sediment control violations. DPWES will be developing a prioritized inspection program, in accordance with guidelines established by the Virginia Department of Conservation and Recreation, that will consider slope, soil type, proximity to streams, and extents of buffer areas to determine an overall rating for any given site. These proposed resource requirements and organizational improvements are being led by the County's Environmental Coordinator.

a. Inspections

In 2000, the EFID recorded an average of 674 Erosion and Sediment (E&S) control inspections per month for over 1,200 major projects. Additionally, staff recorded an average of 280 E&S control inspections per month for over 1,275 minor projects. They also issued 27 Notice of Violations per month for violations of Chapter 104 of the *Fairfax County Code*.

Litigation against two of the upstream developers for off-site damages associated with land development activities has commenced and trial dates have been scheduled. In addition, the County has engaged the services of a consultant to prepare a plan to remove 6,100 cubic yards of sediment from Lake Martin. Additionally, plans to retrofit two upstream existing stormwater management ponds to protect stream channels that drain into Lake Martin have been drafted.

3. Occoquan Basin Nonpoint Pollution Management Program

The Northern Virginia Regional Commission continued in its role as staff to the Occoquan Basin Nonpoint Pollution Management Program. The program was established in 1982 to provide an institutional framework for maintaining acceptable levels of water quality in the Occoquan Reservoir, one of the two major sources of drinking water for much of Northern Virginia. With the release of the 2000 Census data, staff determined that there were approximately 363,000 people residing in the Occoquan watershed as of the year 2000. This represents a four-fold increase in population from when statistics were first collected in 1977. The Occoquan Program has initiated an update to its 1992 Northern Virginia BMP (Best Management Practice) Handbook. The main emphasis will be on the inclusion of previously innovative, but now accepted techniques such as rain gardens and some non-structural BMP techniques with demonstrated removal efficiencies. All Northern Virginia local governments have been contacted by staff soliciting representation to an *ad hoc* subcommittee that will be used to guide the process.

4. Soil and Water Conservation Technical Assistance

In calendar year 2000, NVSWCD:

- Reviewed and commented to DPWES on 71 site development plans regarding erosion and sediment controls;
- Provided assistance to other state and local government agencies (including the Virginia Department of Transportation) 36 times;
- Provided assistance to consultants, engineers and developers 182 times;
- Provided land management assistance to individual homeowners and associations 494 times (340 by office or phone visits, 154 by site visits);
- Provided assistance to pond owners/managers 37 times; and
- Provided assistance regarding rezoning applications to Department of Planning and Zoning 260 times.

5. Backyard to Bay Program

NVSWCD created and distributes the *Citizens Water Quality Handbook*, a practical guide to water quality, that contains chapters on watersheds, water conservation, nonpoint source pollution, stream management, wetlands protection, water quality monitoring, environmentally friendly lawn care, specific suggestions for "making a difference," and a listing of agencies and organizations that provide services, information, and help related to water quality. *Don't Dump Oil*, a Spanish language brochure, explains that dumping used oil into storm drains is not only illegal, but can harm people and the environment.

G. WATER POLLUTION ENFORCEMENT ACTIONS

1. Virginia Department of Environmental Quality (DEQ)

DEQ reports that it had 68 Underground Storage Tank cases and 236 Pollution Response cases in Fairfax County in 2000.

H. DRINKING WATER SUPPLY

The County's water supply comes from the Potomac River, the Occoquan Reservoir, Goose Creek, community wells, and private wells. The Fairfax County Water Authority (FCWA) also provides drinking water to the Prince William County Service Authority, Loudoun County Sanitation Authority, Virginia America Water Company (City of Alexandria and Dale City), Town of Herndon, Fort Belvoir, Dulles Airport, and Lorton Correctional Institution.

With the exception of some wells, prior to use the water must be treated. The County's water use decreased to 47.43 billion gallons in 2000. Table I-1 presents the 2000 sources of the County's water supply.

Table I-1
Sources of Fairfax County's Water Supply, 2000

Sources	Gallons (in billions)
Occoquan Reservoir (Lorton/Occoquan)	20.03
Potomac (Corbalis)	27.39
Wells	0.03
Purchased	0.05
TOTAL	**47.43**

Source: Fairfax County Water Authority

1. Wells

The five (5) FCWA wells and their two (2) distribution systems were monitored monthly for bacteriological quality and annually or semi-annually for Volatile Organic Compounds (VOCs). In 2000, the wells were tested semiannually for metals, nutrients, solids, odors, color, pH, alkalinity, and turbidity. During 2000, four of the six wells exceeded the Secondary Maximum Contaminant Level (SMCL) for odor and two for iron. These are non-enforceable limits relating to the aesthetic quality of drinking water.

During quarterly monitoring in 2000, four (4) wells showed trace levels of VOCs. The monitoring results on wells met the Virginia Department of Health (VDH) Water Works Regulations.

Lead and Copper monitoring in accordance with EPA and VDH Waterworks Regulation was performed on one (1) distribution system in 2000. The system met all regulatory requirements. The corrosion control program for this well system was enhanced in 1999 through the addition of a pH adjuster to inhibit corrosion. Monitoring results have improved since that time.

2. Lorton and Corbalis Systems

a. Trihalomethanes, Chloramines, and Other By-products of Water Treatment

Trihalomethanes are by-products of chlorination water treatment and are thought to be carcinogenic.

b. Trihalomethanes (THM) Monitoring Project

The distribution system running quarterly averages were below the Maximum Contaminant Levels (MCL) for total trihalomethanes (TTHM) of 100 ug/L. The 2000 running quarterly averages for TTHMs were 34 ug/L and 50 ug/L for the Corbalis and Lorton distribution systems, respectively.

c. Disinfectant/Disinfection By-products (D/DB-P) Rule

EPA has promulgated Stage I of the D/DB-P Rule, which lowers the total THM MCL from 100 ug/L to 80 ug/L. (TTHM - Total Haloacetic Acids, Bromate, and Chlorite and the Disinfectants, Chlorine, Chloramine, and Chlorine dioxide). The rule also sets a Maximum Residual Disinfectant Level (MRDL) for chlorine of 4 ug/L. FCWA is presently testing for these chemicals in the water treatment systems. To obtain lower TTHM (total THM) concentrations, the new facilities for ozonation are being constructed at the Corbalis and Lorton facility.

d. Heavy Metals

FCWA tests drinking water quarterly for aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, copper, lead, magnesium, mercury, nickel, potassium, selenium, silver, thallium and zinc and on a monthly basis for iron, manganese and sodium. The levels of these metals continue to be below their MCL or SMCL. According to FCWA, "the concentration levels for the unregulated metals were within an expected range." During 2000, FCWA monitored 100 customer taps for lead and copper according to EPA regulations. FCWA met all EPA requirements for this rule.

e. Enhanced Surface Water Treatment Rule (ESWTR)

The following summary is taken from information provided to EQAC from FCWA. According to FCWA, the ESWTR assumes that revisions to the current Surface Water Treatment Rule may be necessary to provide additional protection from pathogenic organisms. The first step toward developing the ESTWR was microbiological monitoring; one year of data has been used to develop requirements for an interim ESWTR. The long-term ESWTR will be based on additional data

collection and refinement of the interim ESWTR. The proposed ESWTR will provide for a sanitary survey of the entire system, a maximum contaminant level goal for cryptosporidium of zero, and treatment alternatives.

f. Other Monitoring Programs

During 2000, the FCWA Laboratory monitored the surface waters and finished drinking water for 42 Volatile Organic Compounds (VOC) and 39 Synthetic Organic Compounds (SOC). No VOCs were detected in source waters except for trace amounts of Methyl Tertiary Butyl Ether (MTBE), a non-regulated parameter. MTBE has been detectable in high amounts in source waters. The only VOCs detected in the finished water systems were TTHMs and trace amounts of MTBE. The few SOCs that were detected were detected in both the finished and source waters and were at trace levels significantly below the Maximum Contaminant Levels.

g. Residuals Disposal

Residuals occur as the result of heavy sediment loads entering the freshwater intakes and having to be removed from the water prior to treatment. Residuals generated at Corbalis are presently being applied by contract to agricultural lands in Maryland and Virginia. The FCWA is studying the possible use of polymers in lieu of lime in the dewatering process. If polymer condition dewatering becomes feasible, the solids volume for disposal may decrease.

h. Consumer Confidence Reports

Federal regulations require water suppliers to provide annual reports on the quality of the drinking water to their customers through the Consumer Confidence Report (CCR) Rule. FCWA customers received their first annual CCR in the summer of 1999. The 2000 CCR is available for review on the FCWA web site at http://www.fcwa.org.

i. New Treatment Plant in Lorton

The FCWA is building a new state-of–the–art 129 mgd (million gallons per day) water treatment plant, expandable to 160 mgd, to replace the existing Lorton and Occoquan treatment plants in Lorton. In addition to flocculation and sedimentation, the plant will include advanced treatment processes of ozone disinfection and biologically active, deep bed, GAC (granular activated carbon) filtration. The Raw Water Pumping Station associated with the new plant will also have a capacity of 120 mgd and be expandable to 160 mgd.

j. Interstate Commission on the Potomac River Basin (ICPRB) Cooperative Water Supply Operations (CO-OP)

The ICPRB plays several important roles in providing for the region's current and future water supply needs. The CO-OP Section facilitates the agreement among the three major water utilities (Fairfax County Water Authority is one) that require water suppliers to share resources during times of low flows in the Potomac River. The Water Resources Section also provides technical water resources management assistance to the jurisdictions throughout the basin.

k. Metropolitan Washington Council of Governments (COG) Water Supply and Drought Awareness Response Plan

In response to the droughts of 1998 and 1999, COG brought together a task force in May 2000 to coordinate regional responses to reduced availability of drinking water supplies during droughts. The plan consists of two components:

(1) a year round plan emphasizing wise water use and conservation; and
(2) a water supply and drought awareness and response plan.

The Interstate Commission on the Potomac River Basin handles the administration of the coordinated drought response for water withdrawals from the Potomac River and during low flows. Additionally, the CO-OP Section works with COG and the Drought Coordination Committee to assist in providing accurate and timely information to basin residents during low-flow conditions in the Potomac.

I. NEW LAWS OR REGULATIONS

1. Chesapeake 2000: A Watershed Partnership

In June, 2000, the Governors of Maryland, Virginia, and Pennsylvania, the Mayor of the District of Columbia, the U.S. EPA Administrator, and the Chairman of the Chesapeake Bay Commission signed a new compact entitled "Chesapeake 2000: A Watershed Partnership." A goal of this agreement is to remove the Bay and its tidal tributaries from the federal list of impaired waters. This will require new water quality standards designed to protect and restore critical habitat for aquatic plants and animals, the development and attainment of nutrient and sediment load reduction targets, and the "capping" of nutrient and sediment loads to ensure that load reduction targets, once attained, will be maintained over time. Related goals of the Chesapeake 2000 agreement address: living resource protection and restoration; habitat protection and restoration; other water quality protection and restoration issues; land use; and stewardship and community engagement.

J. AMENDMENT TO THE POLICY PLAN FOR WATER QUALITY PROTECTION

In recognition of the growing awareness of the impacts of land use decisions on water quality, the environmental subcommittee of the Planning Commission met for several months with County staff and EQAC beginning in June 1998. County staff proposed an amendment to the County's *Policy Plan* that is based largely on these discussions; the amendment was heard and accepted by the Board of Supervisors in October of 2000. This amendment places into the Fairfax County Policy Plan language that supports the protection of, and minimization of impacts of development and redevelopment to, streams.

K. SUMMARY

Fairfax County streams and watersheds continue to be impacted by four basic problems.

First is the failure of comprehensive land use planning and site design over time to adequately incorporate watershed and stream protection requirements into their decisions and to consider the cumulative effects of land use decisions on Fairfax County's streams.

Secondly, at times, high levels of fecal coliform bacteria occur in specific streams throughout the County.

Thirdly, stormwater runoff and erosion continue to be the largest problems within Fairfax County streams. Most Fairfax County streams have increased stormwater runoff flows that exceed the capacity of their stream channels. This has created an ongoing erosion cycle that includes eroding stream banks, heavy sediment loads, and sedimented stream bottoms. This erosion cycle persists for years, if not decades, until the stream channel widens to accommodate the flow. This has resulted in erosion problems throughout the County on trail systems, homeowners' backyards, business' landscapes, and transportation infrastructure such as bridge abutments. In addition, these ongoing erosion patterns have resulted in numerous large and small ponds and lakes throughout the County having enormous sediment deposition, which then requires frequent maintenance and dredging to maintain depth. Sediment on stream bottoms results in reduced habitat and diversity, and compromises food webs within watersheds. Sediment also compromises the quality of, and increases the expense of, treating the drinking water within the Occoquan Reservoir. Poor land use planning, inadequate enforcement of soil and erosion laws, and inadequate stormwater management in past years has significantly contributed to these erosion problems. Only a few streams, such as those in E. C. Lawrence Park, remain undisturbed and excellent examples of healthy streams in Fairfax County.

Lastly, there is no one component of the Fairfax County government responsible for the

management and protection of the County's streams or environment. County stream assessment and control have been parceled out to various agencies. Conflicting results have sometimes occurred as stormwater management strategies and policies have sometimes resulted in degraded stream habitat.

However, the reformation of the Environmental Coordinating Committee under the Deputy County Executive and the work and guidance of the Environmental Coordinator have done much to move towards more coordinated efforts. It should also be added that the Fairfax County Stream Protection Strategy Baseline Assessment in 2000, the amendment to the Policy Plan to address stream protection that was passed in October 2000, and the recommendations of the Infill and Residential Development Study report (issued in 2000) pertaining to stormwater management and erosion and sediment control matters are significant first steps in addressing many of these issues. Fairfax County should be commended for the efforts that it is making to protect and restore local streams.

However, as long as the rate of stream degradation surpasses stream protection and restoration efforts in Fairfax County streams, the trend will continue to be a downward one.

L. RECOMMENDATIONS

1. EQAC strongly recommends implementation of a Comprehensive Countywide Stream Management Program.

Fairfax County's stream and other water resources are a legacy to preserve and protect for today's citizens and future generations. The well conceived and well–done countywide stream assessment report was released in January 2001. This underlying scientific examination of existing stream conditions is being and should continue to be used to create a well-coordinated and well-planned effort to establish priorities to protect, restore, and monitor changes to these resources using watershed and sub-watershed based strategies. EQAC strongly endorses the work of the County Board and staff in these efforts.

Along with the new Stream Protection Strategy rankings and management recommendations, this strategy should also include:

a) Coordination of all water quality monitoring reports and ongoing assessments of existing watersheds, to include point and non-point sources, including amounts of impervious surface and vegetative cover;

b) Maintenance and inspection of County BMPs at the highest level; and

c) Provision of funding at a level that is adequate to create and implement a fully functional stream protection program.

2. EQAC recommends the funding of the Stormwater Utility Program/Watershed

Protection and Restoration Program.

This program should include the following conditions:

a) Equal importance devoted to environmental protection, restoration, and monitoring as compared to infrastructure improvement and maintenance;

b) Establishment of a Watershed Board to oversee such a program and to ensure that the above conditions are met; and

c) Implementation of this should follow the recommendations of the Forested Wetlands Committee, which includes a careful examination of each site to ensure that disturbances to wetlands and other unique environmental features are minimized. It should also include structures and practices that allow bioretention and recharge to aquatic systems.

3. EQAC recommends that the County initiate a study as to the sources of fecal coliform bacteria in Fairfax County streams within 12 months and subsequently implement a plan to address the sources of actual threats to public health.

County streams have continued to show high coliform bacteria counts. Total Maximum Daily Loads (TMDLs) for coliform bacteria have been developed for Accotink Creek and Four Mile Run due to excessive coliform bacteria counts. The sources of the pollution have been identified and steps need to be taken to remediate the problem. While not the only or largest source of fecal coliform bacteria pollution, human fecal coliform bacteria were present in significant amounts in the two streams being tested and remain a point of concern. Until such a time as remediation is made, EQAC recommends a broad and aggressive public education program to include such things as posting signs, working with schools to provide "Safe Summer Tips," preparing news releases, working with homeowner associations, and publishing information in the *Weekly Agenda* and on the County's web page. Any posted signs should contain the following from the 1999 Health Department report: *"The use of streams for contact recreational purposes, such as swimming, wading, etc. which could cause the ingestion of stream water or possible contamination of an open wound by stream water, should be avoided."*

4. EQAC recommends countywide monitoring to collect data on the efficiency of stormwater management ponds, other BMPs, and the effectiveness of required erosion and sediment control procedures, structures, and enforcement efforts. EQAC further recommends the monitoring of streams prior to and after the issuance of stormwater waivers and special exceptions to see the impact on County streams.

While the Health Department Report and the Stream Protection Strategy Baseline Study (DPWES) indicate that Fairfax County streams have varying degrees of degradation, the specific causes are unclear. As a result, we cannot be certain as to which structures and

requirements are effective and working well in what conditions in Fairfax County. Until more data are collected, the continued granting of stormwater waivers and special exceptions should be limited as per EQAC's "Resolution Regarding Stormwater and BMP Waivers" dated July 11, 2001 (See Appendix A).

5. EQAC recommends an accounting of all costs that the County and private individuals and entities spend to counter the effects of siltation and erosion in County streams.

Reston Association, Lake Barcroft, the Fairfax County Park Authority, and private citizen groups are spending millions of dollars to dredge and maintain lakes in Fairfax County. Other money is spent to deal with countless stream bank erosion problems throughout the County. Siltation and runoff are cited by the Fairfax County Water Authority as one of the major reasons for a mid-river intake in the Potomac River. Fairfax County needs to assess the cost of NOT moving forward with an overall watershed protection and stream bank stabilization program.

6. Given the apparent increase in construction activity, EQAC commends the County for additional inspectors and training to handle construction site inspection responsibilities.

EQAC recommends that the County government continue to monitor complaints to determine if the strengthened inspection function results in a decline in number of complaints and violations. EQAC further recommends that the County consider training citizens in preliminary visual inspections to supplement and augment the efforts of County staff. EQAC commends the Board of Supervisors for fully implementing recommendations of the County Executive with the hiring of ten additional inspectors and the provision of additional training.

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OTHER DATA

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Data from Occoquan Watershed Monitoring Laboratory were not made available for this report.